

ABSTRACT OF THE DISCLOSURE

A laser nozzle for use in a laser powder fusion (LPF) welding process provides longer service life and ease of maintenance. Eliminating the use of laser nozzle inserts, the laser nozzle uses an inner tip that is less subject to damage from the welding process. The laser beam travels down an open central passage to exit out the inner tip in focused alignment with a conical powder flow stream ending in a point generally coincident with the laser beam. The powder supply travels through a passage that is generally coaxial to the central laser passage. A circumscribing passage for inert shielding gas or the like is coincidentally coaxial with both the laser powder flow channel and the central laser channel. Coolant is circulated through a main body portion of the nozzle in order to keep the entire assembly cool. Both the laser and the flow of powder may be adjusted according to operating preferences. A porous shielding cover prevents ejecta and other materials from entering into the shielding gas flow channel. The entire assembly is easily constructed from readily available materials and is easily disassembled for cleaning. Reassembly is also easily achieved in order to enable rapid refurbishment and reconstitution of an optimal LPF welding nozzle.

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